

PSSR 65/1 (2013):35-70

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The Pathogenic Body in Colonial Science, 1901-1913

Abstract This paper is a postmodernist reading of how laboratory science and its textual, discursive form, the scientific paper, connived in the construction of the Filipino body. It aimed to show how the knowledge-power relations played out toward the pathologization of the body, how forms of power were lodged in such institutions as the laboratories of the Bureau of Science, and how disciplinary procedures and technics reflected cultural and racial distinctions. It drew largely its primary sources from the scientific papers published in the *Philippine Journal of Science* and examined these sources through a Foucauldian lens. The scientific paper textualized laboratory work that projected a diseased, unhygienic Filipino body that needed to be controlled and reformed vis-à-vis American corporeality that was disciplined, ennobling, and a product of evolutionary growth. Its claims for truth, accuracy, and authority on the one hand, and the role that it played in Benevolent Assimilation on the one hand, justified intrusions into everyday life and the body through medical surveys and laboratory examinations for pathogens. Colonial science turned the Philippines into a laboratory and the Filipinos as participants in experiments that had a bearing on racism, including the rationalizations on fitness for self-government that was at once political, cultural, racial, and bodily.

The Pathogenic Body in Colonial Science, 1901-1913

Introduction

Colonialism is not satisfied merely with holding a people in its grip and emptying the native's brain of all form and content. By a kind of perverted logic, it turns to the past of the people, and distorts, disfigures, and destroys it.

Frantz Fanon
Wretched of the Earth



In stark contrast to the Spanish regime, American rule was foregrounded primarily on bringing science and progress to the archipelago. "The history of scientific progress in the Philippines begins with our occupation of the islands" (*Manila Times*, 1911, p. 28), wrote W.E. Musgrave. While Musgrave's declaration may have been true at the start of the U.S.'s presence in Asia, much recent critique on this hegemonizing stance has been forwarded. Musgrave's declaration can be read as one that obviously proceeds from a *leyenda negra*. The black myth dismissed the previous Spanish colonial regime as backward, irrational, and decadent, akin to the Medieval. On the contrary, it has been shown that "the Spanish colonial official, foreign naturalist, and the missionary father were as well versed in the science of their day as geographical location and international communications permitted" (Bankoff, 2011, pp. 79-80).

Be that as it may, America's entry into the imperial enterprise was "a crucible that plunged Washington's raw bureaucracy into the white heat of nationalist revolution and great power rivalry, forging heretofore unimagined state capacities" (McCoy, 2009, p. 5). America lunged into the vortex of challenges brought about by the conquest of a territory ravaged by contagious diseases, an on-going revolution led by secular-elitist and messianic-cum-nativistic patriots, and an inclement weather marked by monsoons and storms, not to exclude the heat and humidity. Despite all of these, empire brought along with it "unparalleled freedom to experiment with new ways to control both man and nature" (McCoy, 2009, p. 7). Thus was born the "imperial turn," as technologies of rule, of control, and of the self, or what Michel Foucault has summed up as "governmentality." It was a rule that was applied in such fields as public health, sanitation and hygiene, medicine, education and evangelization, population surveillance and taxonomy, military and defence capacities, internal and local police power, forest and natural resources management, bureaucratic administration and governance, legalist jurisprudence, constitutionalist political theory, among others.

True to its intentions, the Americans embarked on a massive program of public health and sanitation at the turn of the 20th century. This continued up to the first decade of colonial rule, buttressed as it was by the establishment of laboratories. The laboratories were indispensable in what authorities saw as a people riddled with diseases from microbes and parasites that were endemic in the tropics. The miasmatic conception of illness, of "diseased landscapes," still existed side by side with the germ theory of disease at the time.

On an international scale, major advances in medical science occurred at the turn of the 20th century. There were the successful works of Robert Koch on tuberculosis, Louis Pasteur on rabies, Alphonse Laveran on malaria. The discovery by Ronald Ross, Giovanni Grassi, and Amico Bignami in 1897, that the *Anopheles* mosquito was the vector in malarial transmission added impetus to the

understanding of the disease. Moreover, Patrick Manson founded the London School of Hygiene and Tropical Medicine to provide technical services and scientific training in the Anthropology and Biology of Tropical Diseases. Ronald Ross, the founder of the Liverpool School of Tropical Medicine, shared the same research agenda with the London School.

Biomedicine, which was synonymous with tropical medicine, combined research and medical practice and gained strength during the period. It emphasized the interaction of biology, ecology, the material conditions, and the level of knowledge of people living in the tropics in producing health or disease. By this time, scientific discoveries and the development of new knowledge and skills in understanding and preventing the transmission of malaria, leprosy, plague, yellow fever, dysentery, and cholera had increased the professional standing of scientists and doctors.

The scientific endeavor that resulted from these advances was reflected in the scientific, modernizing project of establishing laboratories. It can be said, at this juncture, that laboratory medicine or clinical pathology was an indispensable arm of biomedicine/tropical medicine. Laboratory researches, experiments, and tests provided important structural and material support to the project. Blood, urine, and feces were subjected to routine and exigent examinations at the height of epidemics. The scientific papers reflected the indispensability of the laboratory because these texts would not have been made possible without the necessary laboratory apparatus and equipment. Weston P. Chamberlain placed great value to the laboratory when he wrote that "disease in this form can be diagnosed by laboratory procedure alone, and it is only by working along this that the true incidence of typhoid fever among Filipinos can be determined" (1911, p. 310). In similar fashion, Munson stressed that "it is evident that in effectively combating a cholera infection, the use of laboratory facilities in the making of bacteriological diagnosis on a large scale is absolutely essential" (1915, p. 5).

Aside from the bacteriological diagnosis of cholera cases, the importance of laboratory work included, to a large extent, the preparation and standardization of cholera prophylactic and conducting protective inoculations against the disease. Well-equipped laboratory and trained assistants became necessary in the manufacture of the prophylactic. The prophylactic was stored in flasks and made available anytime for use during cholera outbreaks. It consisted of the immunizing substances extracted from *cholera spirillum* suspended in saline solution.

Tropical medicine, as understood at the time, was thoroughly applied to the Tropics or the Orient in both its physical/spatial sense. It was a discursive formation, a *fin-de-siecle*, connected to miasmatic notions of disease and its racist underpinnings. Summarized under the term tropicality, it referred to the growing body of scientific knowledge on the tropics. It was substantiated by statistical enumeration of morbidity and mortality. It included medical geography that attributed local diseases to specific climates, vegetation, and physical topographies. More than denoting simply a physical space, the otherness conveyed by tropicality was a conceptual one. It was primarily foregrounded on an imagined region, “which was at once a place of parasite and pathology, a space inviting colonial occupation and management, a laboratory for natural selection and racial struggle and site of moral jeopardy and trial” (Bankoff, 2011, pp. 80-81). It was, in the words of Benedict Anderson, “a new physiology and pathology of colonialism” (1992, pp. 508).

Tropical medicine, which was interchangeably called tropical hygiene, medical climatology, medical topography, or medical geography, was under military supervision and jurisdiction. This was exemplified by the existence of such military agencies like the Army Board for the Study of Tropical Diseases. Under this discursive regime, healthy male bodies were needed not only in “pacifying” armed revolutionaries turned belligerents during the Filipino-American War, but also in the colonization of an unfamiliar archipelago. Eventually,

the highly militaristic texture of this new medical specialty made possible by imperialist global expansion, soon enough, gave way to civilian rule. Consequently, the army physician found himself collaborating with clinical bacteriologists and pathologists inside a laboratory.

The Bureau of Government Laboratories was established in 1901 through *Act No. 156* passed by the Taft Commission. It was given the task to undertake laboratory investigations on the various epidemics that ravaged the colony since Spanish times. During its first year of existence, the Bureau consisted of a chemical and a biological laboratory. A serum laboratory was added two years later. In 1905, the Bureau of Government Laboratories was reorganized into the Bureau of Science through *Act No. 1407*. This further magnified the significant role played by science in the colonial project of transforming the Philippines from a “state of barbarous disorder” to a modern polity. New working divisions were added not only in the medical sciences but also in the general science like chemistry, botany, entomology, mining, ethnology, geology, and paleontology. The new name emphasized the increasing reliance of the regime on scientific and technological approaches and categorizations. From the vantage point of Benevolent Assimilation, “colonization was seen as a humane and progressive act of moral reform and social uplift” which reconstructed the Filipinos into modern political subjects (Rafael, 1995, p. 41).

The Colonial about “Colonial” America

In this postmodern and postcolonial era, there have been numerous re-assessments, re-evaluations, deconstructions of empire (or what Dipesh Chakarabarty calls provincialization, as in “provincializing Europe”). Amy Kaplan (1993), two decades back, urged the academe to rethink orthodoxy in American historiography of the 50s and 60s. This orthodoxy dismissed U.S. imperialist interventions in its former colonies as a “mere episode” in U.S. history. It was associated with the Cold War and was due to an absence of culture from the study of

US imperialism, an absence of empire from the study of American culture, and an absence of the United States from postcolonial studies of empire (Kaplan, 1993). However, much has changed since then, as a generation of social historians, social anthropologists, and students of American culture have begun to reconsider what is colonial about “colonial America”. This is the epistemic field where studies of empire speak to the concerns of U.S. history. As Alfred W. McCoy avers, it is about “putting empire back into American history has been the single greatest achievement of a historiography no longer content with writing solely about U.S. foreign relations” (2009, p. 10).

This paper aims to make a contribution to the history of science in the context of imperial formations and transformations. It presents, from a macro-view, an understanding of the scientific, modernizing project of American rule through an analysis of the colonial state’s production of scientific papers. Through a textual micro-commentary, it aggressively resuscitates as well through an instance of the medical genealogy of “racial thinking that secures racial designations in the language of biology and fixity and in the quest for a visual set of physical differences” (McCoy, 2009, p. 13). Clearly, racial difference was textualized in the form of laboratory reports, medical ethnographies, environmental descriptions, discussions of hygiene engineering, and architecture, along with physiological and anatomical investigations.

A Specific Episteme

The period 1901-1913 corresponds to what is called in Philippine history as the Taft Era. This was the period of Republican governance of the Philippine Islands since William Howard Taft was a Republican. Taft had a direct hand in the formation of Philippine colonial policy in his various capacities as a high ranking official in the colony and in the United States. From 1900-1913, he was Commission Chairman, Civil Governor, Secretary of War, and finally U.S. President. The period can be described as a specific episteme when the new colonial regime was imbued with the need to effect major changes in Filipino values

and institutions. Benevolent Assimilation sought to decriminalize the U.S. from the atrocities that it committed during the Filipino-American War and during the “pacification” of the archipelago. “[T]he allegory of benevolent assimilation which effaces the violence of conquest by construing colonial rule as the most precious gift that the most civilized people can render to those still caught in a state of barbarous disorder” (Rafael, 2000, p. 21).

A History of the Body

This paper seeks to address the construction of the colonial subject at the level of the body. The body has been a site for the deployment of the variety of discourses that include sexual, anthropological, literary, and, in the case of this paper, the medical. Foucault calls this deployment the bio-politic of the population. “[T]he disciplining of the body, the parallel increase of its usefulness and docility, the extortion of its forces and the optimization of its capabilities were largely affected through an entire series of interventions and regulating controls” (1990, p. 15). Foucault’s critique is valorized when western/colonial representations of the colonized others are taken up. O’Hanlon, citing Foucault, notes “the way in which modern societies discipline and subjugate their populations through the production, in the discourses of the human sciences of norms and thoughts of behaviours which lay down the sort of subjects that we are, and prescribed to us the law of our being” (1988, p. 209). The historical anthropologist Ann Laura Stoler gives much credence to the influence of Foucault’s concept of power in studies and researches that deeply discuss not only the emergence of empire, but also how they were maintained. She says,

No single analytic framework has saturated the field of colonial studies as that of Foucault. His claims for the discursive construction of regimes of power have prompted us to explore both the productions of colonial discourses and its effects; inspired, in part, by Edward Said’s forceful lead, students of colonialism have tracked the ties that bound the production of anthropological knowledge to colonial authority, to trace the disciplinary regimes that have

produced subjugated bodies and the sorts of identities created by them. Some have sought to describe how discourses on hygiene, education, confession, architecture and urbanism have shaped the social geography of colonies and specific strategies of rule (1995, p. 1).

The laboratory and the scientific paper were significant aspects of American colonial, scientific, and modernizing project. They, in turn, made possible the epistemological constitution of Filipino bodies into objects of knowledge and control. More than simply embodying the anatomical and physiological, the body serves and functions as a privileged trope by which colonial social relations and inequalities were historically mapped and structured.

My *oeuvre* purports to lay bare the textual representation of the colonial subject's body. During the first decade of American rule, science gave not only importance but legitimacy as well to specific colonial taxonomies of race and corporeality. It gave attention to the idioms of biomedicine (tropical medicine) and laboratory science or medicine (clinical pathology) textualized in the scientific paper. Among other colonial texts and practices, this was crucial, in legitimizing American presence. I forward the view that the modernizing and scientific efforts of the colonial state in instituting a sanitary order made possible the constitution of the colonial subject into a pathogenic and racialized Other.

My study draws largely its primary sources from the scientific papers published in the *Philippine Journal of Science* within the first decade of American rule. This historical moment is characterized as the height of the production of scientific *knowledge* about the Philippines. The word *knowledge* here is underscored because the colonial state, as shown in the scientific paper, was never a neutral observer. *Knowledge* was a prerequisite to surveillance, control, and subjugation. For instance, the Schurman Commission was sent to the Philippines *to know* its condition toward effective rule. My paper points to a perspective where the production of what represents and constitutes scientific and medical knowledge in the context of colonial

rule is given sustained emphasis. The perspective manifests a Foucauldian lens, especially in the area (in this case the pathogenic body) where the inextricable relationship between knowledge and power can be readily seen. Towards the end, I show how forms of power were lodged in particular institutions (laboratories of the Bureau of Science), which were manifested in disciplinary procedures and techniques (the scientific paper) reflecting cultural and racial distinctions.

My paper iconoclastically reads such particular colonial and discursive formation as symptomatic of making visible not only the constituted subject of a scientific, modernizing, and racializing discourse but also “the panoptical articulation of relations of power” (Seltzer, 1992, p. 6). In lieu of producing a historical reconstructionist narrative, I seek to unravel the scientific, modernizing, racializing and, therefore, exclusionary discursive strategy of colonial regime in subject-formation and self-constitution.

The Scientific Paper

The *Philippine Journal of Science* published scientific papers for the first time in 1906. The authors were scientists, military officers, and medical doctors based at the Bureau of Science, the Army Board for the Study of Tropical Diseases, and the Bureau of Health, including those by visiting researchers. Papers read before the annual meetings of the Philippine Islands Medical Association, the Manila Medical Society, and the first biennial meeting of the Far Eastern Association of Tropical Medicine were included as well in the journal. The first issue of the journal consisted of one volume of 10 researches on all the principal fields of science and five botanical supplements. By 1907, due to the increase of research material submitted for publication and the varied nature of each material, it was decided to divide the journal into three sections: general science; medical sciences; and botany. A fourth section on ethnology, anthropology, and general biology was added in 1910.

Before the reorganization and renaming of the Bureau of Government Laboratories into the Bureau of Science, researches and experiments were published in bulletin format. A total of 36 bulletins were published under the Bureau of Government Laboratories. However, there was a need to shift to the journal form because it had been found impossible to obtain subscriptions on the basis of bulletins alone. Following the reorganization, there was likewise a necessity to change from a bulletin dealing with individual topics to a journal that would gather all laboratory work in all principal fields of science.

The scientific paper emerged as the genre closely associated with the laboratory. It was conceived to radiate scientific truth and medical authority on colonial science, especially in the field of tropical medicine. It was a systematic investigation or medical examination and not simply a memoir, a travelogue, or administrative report. As a whole, they constituted "the body of representations of the Philippines" (Vergara, 1995, p. 23). In the context of my paper, the scientific paper differed in more ways than one from other texts. According to Anderson,

Each paper displays a stylistic completeness with an introduction, methods section, results (often tabulated), and a conclusion (usually in point form). They all display publication dates. Their authors are listed along with their qualifications and institutional affiliations and the information is conveyed in the third person located in the present or immediate past (1992, p. 5).

The scientific papers published belonged to the medical specialization of tropical medicine in such areas as parasitology, normal human physiology in the tropics, and tropical hygiene. Parasitology was based on an understanding that diseases were primarily vector-transmitted. The study of normal human physiology focuses on issues of racial difference particularly racial distinctions, with especial reference to acclimatization and adaptation of both white and non-white races. Tropical hygiene was actually hygienic

engineering that intended to reform unhygienic behaviors, particularly in connection with the disposal of human excreta, expectoration in public, eating habits, to name a few. These fields were not strictly distinct from each other because a single medical discourse at the time made possible their discursive formations. The scientific papers were published as parts of a continuing inter-textual series. Those that I discuss belong to the fields of parasitology and tropical hygiene.

Parasitology

Tropical medicine emerged out of a then popularly accepted epistemological field known as “disease of warm climates” in the 1700s and 1800s. Disease was believed to be caused by the combined factors of geography, temperature, and climate. Not long after with the discovery of bacteria, viruses, and parasites, the old notion was juxtaposed with the nascent specialty known as tropical medicine, which based its strength primarily on laboratory experiments. This new trend insisted that the prevention of the spread of any disease must presuppose knowledge of its etiology, the factors, and prevention and treatment. Such knowledge can only be gained by investigating the symptoms of a disease and performing laboratory experiments.

In “The Investigations Carried On by the Biological Laboratory in Relation to the Suppression of the Recent Cholera Outbreak in Manila,” Richard Strong (1907) focused on laboratory measures done in connection with cholera epidemics that swept the Philippines. The paper was one of the best on parasitology at the time. The bacteriological diagnoses were done directly from human feces in the most objective and clinical manner. The language used expressed the author’s expertise in laboratory work and medical jargon. The introduction discussed Asiatic cholera and its victims in the Philippines, the discovery of the first cure of cholera, and the laboratory work done thereafter. The method section described in detail the procedures in preparing the plate cultures. Strong says,

Numerous alkaline agar plate cultures were prepared directly from the cholera stools, some being inoculated with large and other with small portion of the feces, various dilutions being prepared. The cultures were placed at 37 degrees Celsius and as soon as the colonies became sufficiently developed, those which resembled colonies of the cholera *spirillum* were suspended in saline solution (1907, p. 414).

The scientific paper by Strong showed the interest in invisible pathogens attacking the human body. It represented a shift from the idea that the tropical climate was the only cause of disease and degeneration to germ theory. Beneath the scientific rigor, one cannot help but notice the sub-text alluding to Filipinos as carrier of parasites.

Philip Garrison (1908) wrote on the prevalence of animal parasites in the intestines of 4,106 inmates from Bilibid Prison. The scientific language used in the paper demonstrated the medical advances that occurred at the turn of the century, which was based on the assault of invisible microbes and the body that hosted them. Garrison's text, like the rest that will be discussed here, positioned the native as germ "carriers". Almost all of the population of the prison were examined during the year. Prisoners newly admitted were subjected to examination at once in quarantine while others were placed in a special ward until specimens of feces could be obtained and studied (Garrison, pp. 191-209).

Ernest Linwood Walker wrote a lengthy and exhaustive paper on the amoeba (Walker, 1911). In his introduction, he emphasized the need to do a comparative study of amoebas found in three sources: the water supply; the intestinal tract of healthy persons; and the intestines of those who had dysentery. The paper included a taxonomy of the different kinds of amoebas discovered by scientists at the time in Latin America and Asia. The notion that natives harbored these parasites was confirmed when "in 1906 *Paramoeba hominis* was found in the stools of six natives in the Philippine Islands in which diarrhea associated in three (3) cases

with the passage of a small amount of blood was the only symptom” (Walker, 1911, p. 261).

Tap water from the Manila water supply was collected and examined microscopically in the Biological Laboratory of the Bureau of Science. Water amoebae were found in 23 of 25 samples. The types of amoebae found were classified and described in detail by Walker. One amoeboid organism, writes Walker,

is characterized as an amoeboid trophozoite in which the chromatin of the nucleus is collected into a relatively large and dense karyosome that is surrounded by an achromatic halo which possesses with rare exceptions, a contractile vacuole, and which reproduces by binary fission and by spore formation (p. 265).

The very technical and scientific language used in text reinforced the idea that this sort of document was superior because it was based on hard data. It also constructed the native as carriers of parasites, whose intestinal tracts *must* be examined for the amoebas that they hosted. Walker continues, saying,

The material from which these cultures have been made has consisted of fresh stools containing amoebae from 113 healthy persons suffering from disease other than amoebae dysentery and from 21 cases of amoebic dysentery, and pus containing amoebae from 2 cases of amoebic liver abscess obtained from the drainage tube after operation and also in one of the cases, post-mortem from the infected liver. This material has been obtained chiefly from the hospital of Bilibid Prison (p. 265).

Flagellates and ciliates and other protozoans were the subjects of E.H. Ruediger’s preliminary report (1911, p. 158). Flagellates and ciliates were found in the diarrheal stools of a camping party after a routine stool examination, and the source of infection was traced to the water used by the camping party. The results of the bacteriological analysis of water samples showed that a large number of ciliates were present in a sample of one 1,000 cubic centimeters of water from water coolers. Another 1,000 cubic centimeters of water from

receiving cans were swarming with flagellates. Other forms of protozoa were “twice cultivated from diarrheal stools and were always found in cultures made of sewage and from a spring which during rain received the surface drainage of several hundred meters of wagon road” (Ruediger, 1911, p. 158).

In another paper by Fred D. Bowman, routine examination of feces at Bilibid Prison revealed that 16 patients were infected with the parasite *Balantidium coli*. Usually the person with this kind of infection had frequent *tenesmus* or painful defecation. The stool appeared very thin and sanguineous. Microscopic examination of the feces showed many *balantidia* present, 30 or 40 in one cover glass specimen, and much blood and mucus. The parasites were found in the feces during frequent diarrhea. “[T]he organisms moving along in the *submucosa*, become so numerous as sometimes to form nests from which low inflammations develop and which, proceeding to ulceration, cause erosion of the *mucosa* and set free the *balantidia*” (Bowman, 1911, p. 150).

Fetish for Feces

The examination of human feces was as an answer to was not surprising then for Garrison did not hesitate to feed the participants in his study with “a dose of magnesium sulphate to hasten bowel movement” (1908, p. 192). A similar method was done in an extensive medical survey in Taytay, Rizal where “most of the stools were passed after a dose of Epsom salts” (Strong, 1908, p. 28). Some researchers did not have second thoughts of feeding the participants with organisms cultured from the stools of disease carriers and from acute cases for samples (Walker and Sellards, 1913). However, in the experiments done in Rizal, Cavite and in the Cagayan Valley, the administration of purgatives like magnesium sulphate was stopped because most of the patients who were given the substance never came back (Sissler and Gomez, 1909). At a minimum dose, Epsom salt can cause sweating, warmth, flushing, nausea, vomiting,

headache, palpitation, dryness of the mouth. Higher doses of this osmotic purgative can result to loss of deep tendon reflexes, respiratory depression, and cardiac arrest. Although the text does not tell us if those who were given Epsom salt experienced the side effects, it maybe surmised that, most probably, some of the participants in the study suffered.

The laboratory offered instances for the examination of living amoebas in fresh stools. Walker says,

The stools have been studied fresh in ordinary cover-glass and slide preparations. Stained preparations of the feces and the pus from liver abscesses have been made by spreading thin smears on cover-glasses, floating them "wet" on the surface of Zenker's fluid for five minutes, washing in water until the fixing fluid is removed, water, dehydrating in different grades of alcohol, clearing oil organism and mounting in xylol balsam (1911, p. 67).

Chamberlain, Bloom, and Kilbourne applied a similar method in the stool examination of 119 adult Igorot laborers in Baguio. Three cover-glass preparations of feces in each case were completely looked over before recording the results. In some instances where ova were found, a still further search was made (Chamberlain et al., 1910). No room for error was permitted to ensure the discovery of a great majority of vermicular infections. In the same article, findings showed that 92.5% of the participants had ova of some intestinal parasite in the evacuation. The other parasites found in their stools were *Ascaris lumbricoides*, *Tricocephalus dispar*, *uncinaria*, and *taenia*. The results confirmed Garrison's findings: that of the 4,106 Bilibid prisoners examined, 3,447 or 84% were found to be infected with one or more species of an animal parasite (1908). There was also a case of a prisoner infected with nine different parasites. The parasites that were discovered in the prisoner's stools were the following:

The two hookworms *Necator* and *Agchylotoms*, the common whipworm *Trichuris*, the common pin or seat worm *Oxyures*, the worm of *Codinelluna diarrhea*, *strongyloedes*, the cestode genera *Teania* and *Hymenolepsis*, the

Japanese lung fluke *Pargonimus*, the Japanese liver fluke *Ophistorilasis*, the Japanese blood fluke *Schistozoma*, and the four protozoal genera: *amoeba*, *balantidium*, *lamblia*, and *cercomonas* (Garrison, 1908, p. 198).

In his paper on intestinal parasites on Cagayan Valley, David G. Willets examined 4,278 natives of San Antonio and Maluno barrios of Ilagan, Isabela Province (1911). The result of his examination yielded 3,656 persons or 85.46% infected with intestinal parasites. The participants in the survey, who were mostly Ilocano migrants to Cagayan Valley, were infected with hookworms.

The results of the examinations at Taytay, Rizal agreed with those of other studies, showing the Filipinos as a pathogenic race universally affected with intestinal worms. At Taytay, infections with intestinal worms were found in 96% of the participants (Strong et al., 1908). The prevalence of intestinal infections caused by parasites was observed by Garrison when he reported that

applying the rates of the infection obtained from the four thousand one hundred six (4,106) prisoners examined at Bilibid to the total population of the islands (about seven million) it would appear that five (5) million persons in the Philippines are infected with intestinal worms (1908, p. 207).

Great value was given to laboratory examinations of feces because of their importance to the careers of the investigators. Strong, who identified the dysentery bacillus, was awarded the first Chair of Tropical Medicine at Harvard. Walker and Andrew W. Sellards (1913) were credited for obtaining experimental evidence that *Entamoeba histolytica* is the cause of *amoeba colitis*, and *Entamoeba coli* is a harmless commensal of the large intestine. Their paper was included in post-World War II literatures on parasitology.

The systematic isolation, disinfection, and, therefore, disciplining of native orifices must have rendered their orifical products odourless and perfect for examination in the laboratory. The ritual of the laboratory and its textual inscription in the scientific paper “had conferred on shit the *epistemological clarity* of just one more specimen

among the many," (Anderson, 1995, p. 669). Strong's discussion about the rice-water contents of the small intestine, where stool specimens provided the much needed information and solution, was influential in post-mortem examinations of Asiatic cholera.

There was, however, an incident that revealed the dark side of the experiments by scientists like Strong. According to Sullivan,

[O]n November 16, 1906, while Worcester was on leave, Strong inoculated twenty four Bilibid Filipinos with what was supposed to be a fresh batch of anti-cholera vaccine. Ten of the prisoners died from bubonic plague as Strong had erroneously injected his subjects with virulent plague *bacillus*. Despite evidence of negligence and coercion of prisoners, Strong was eventually exonerated by the Attorney General of the Philippines, Gregorio Araneta (1991, pp. 112-113).

Eugene R. Whitmore was able to isolate dysentery and dysentery-like bacillus from stools in the dry and hot months of 1909. He prepared his plates in the laboratory in Manila, took them with him to the provinces where the dysentery was most active, streaked the plates, and then brought them back to the laboratory with him. When he remained in the province for a few days, he picked colonies and transplanted them into tubes before coming back to Manila (Whitmore, 1911, p. 217). Feces became a source of scientific truth and objectivity, if not "a tremendous source of power" (Douglas, 1976, p. 35). Semiotically speaking, feces, an "abomination", acquired a "cultured" texture such that it became a very powerful source of signification.

The fetish for feces shows that the "colonial subject who is the object of surveillance is also the object of paranoia and fantasy on the part of the colonizers" (Young, 1990, p. 144). Moreover, according to Young, abjection's paradox serves to destabilize the colonial system for "without such instability of power, anti-colonialist resistance would itself be powerless" (1990, p. 145). While it is true that surveillance constitutes the colonial subject, "an inner dissension within a colonial discourse structured according to the conflictual

economy of the psyche is articulated” (Young, 1990). For, according to Homi Bhabha,

The construction of colonial discourse is a complex articulation of the tropes of fetishism-metaphor and metonymy – and the forms of narcissistic and aggressive identification available to the imaginary. Stereotypical racial discourse is then a four-term strategy... One has then a repertoire of conflictual positions that constitute the subject on colonial discourse. The taking up of any one position within a specific discursive form, in a particular historical conjuncture, is then always problematic – the site of both fixity and fantasy. It provides a colonial “identity” that is played out in the face and space of the disruption and threat from the heterogeneity of other positions (1983, p. 204).

The Pathogenic Body

Stool examinations offered the opportunity for scientists to enhance and develop their professional careers. The findings confirmed the laboratory’s power through its methods of transforming the largely infected tropical environment and the natives as sources of danger. “[T]he carriers would seem to be not only the most numerous but the most insidious and dangerous sources of infection” (Munson, 1915, p. 9). Aside from representing persons as controllable data and figures, the laboratory and the scientific paper succeeded in projecting the Filipinos as carriers of infections. A subtext could be discerned beneath the rigors of the scientific method, a discourse that constructed a degenerate, dangerous Filipino body vis-à-vis its binary opposite, the transcendent American body, “The White Man in the Tropics” (Manderson, 1993, pp. 74-75).

The scientific paper reinscribed Filipino docile bodies as if they were part of the pathogenic environment that laboratory medicine was trying to subjugate. The scientific papers were presented in medical conferences and published for posterity in the *Philippine Journal of Science*. They carried out a kind of *epistemic violence* by inscribing on Filipino bodies the jargon of science, that Filipinos “could be taken as collectives, unclean, subject to zoological laws and part of the ecology akin to parasites” (Anderson, 1992, pp. 520). They

had the power to transgress the “normal,” the “natural,” the “order of things.” The textual representation valorized the visceral region (e.g. orifices, belly, legs, feet, buttocks, genitals) over the upper region (e.g. head, spirit, reason). It is synonymous with Bakhtin’s concept of the carnival as a mode of understanding, positivity, and a cultural analytic. Such carnivalesque conceptualization was premised on the subversion of hierarchy, out of which a grotesque body emerges where “its opening and orifices are emphasized not its closure and finish” (Stallybrass and White, 1986, p. 9).

Using Foucauldian paradigm as his propeller, Mark Seltzer, in his study of realist novels of the 19th century, widens the panoptical gaze by asserting the obstetrical form of realist discourse. According to him, “this imperative involves at once a fantasy of surveillance and a requirement of embodiment, that is the realist desire to see is also necessarily a desire to make visible: to embody, physically or materially character, persons” (Seltzer, 1992, pp. 95-96). He further states that this phenomenon has been called by a number of names: Crane’s “machines of perception;” Zola’s “the mechanisms of the eye;” and Jacob Riis’s “the social technologies of an eternal vigilance.” Embodiment not only required the project of making visible but also the visual dissection of the body, the corpus turned inside out, what bodies contained were both known, visualized. The scientific papers, in which the intestines of Filipinos were visualized, including feces and parasites, demonstrated this. But there is no need for the celebration of the lower bodily part in the true Rabelaisian carnival spirit as enunciated previously by Bakhtin. During the outbreak of cholera and other diseases, Filipinos became statistical persons, whose bodies were turned inside out: their dirty hands, parasite-ridden guts, gaping orifices made visible to the penetrating but invisible gaze of Benevolent Assimilation.

Reterritorialized Invisibility

The survey’s laboratory techniques and procedures revealed the spectacle of transforming the disarray of the tropics into something

that was measurable and controllable. The participant's personal histories were excluded from the textual inscription such that the reader would get the impression that they were merely experimental variables, statistical data, or, in most instances, "clinical material." Thus:

As regards the inhabitants, anthropometric measurements *were performed* and in the case of those who visited the station and particularly in those who were found sick or abnormal, a physical examination was *performed*, the blood, feces, and sputa *were examined* microscopically and examinations of the urine *were made (underscoring mine)* (Strong et al., 1908, p. 208).

The italics show that the survey had a penchant for the use of the passive voice. The passive construction made it appear that the participants were innocently submitting themselves to laboratory scrutiny. It excluded them from active participation such that their identities were effaced; the whole event of obtaining their stools appeared ahistorical. It denied them agency in "the many negotiations that were required in the field for a scientist to generate such a text" (Anderson, 1992, p. 521). This was not surprising because, according to one investigator, as cited by Anderson, "it was impossible, even with the good interpreters available to obtain histories from Filipinos for the men were sullen, stupid and often purposefully deceptive" (p. 519).

The participants in the experiments were reterritorialized in textual spaces. The scientific paper deliberately created and projected the Filipino body as distinct and opposite to the very filth, chaos, and disarray that gave rise in the first place to the colonial subjects' epistemic and discursive formation. In this newly constituted and occupied space, the participants were made to appear detached from and unanchored to a particular socio-historical circumstance as the textual utterance or enunciation of the scientific paper. As Anderson put it, the scientific paper "excludes them from the full meaning of the same utterance thus defined by the structure of colonial inequalities" (1992, p. 251).

The Dangers of Excrement

The survey narrated the unsanitary and dangerous waste disposal practices of the inhabitants. It referred to “those who have neither outhouses nor pits, either use a vessel in the house which is emptied early in the morning at any convenient place or if they live near the edge of the town, they go into the nearest clump or bushes (Strong et al, 1908, p. 252). Urinary practice never escaped the investigator’s panoptical eye, “how urination at home is frequently performed through the kitchen floor (Strong et al, 1908, p. 252). Outside and away from their homes, women urinated, “squatting the skirts arranged as wide a circle as possible while men go up and face the nearest bush, tree or wall” (Strong et al, 1908, p. 287). Sanitary conditions in the colony were deplorable because over 50% of the inhabitants there was no conscious disposal of feces – around half of the houses in the town there were no provisions for such disposal (Strong et al, 1908, p. 287). Since there were no sanitary toilets to speak of, the excreta deposited on the surface of the ground almost anywhere in the neighbourhood and left exposed to the rain, or the sun or pigs and chickens to dispose of (Strong et al, 1908, p. 287).

Jackson reported a similar observation when he wrote that “defecation is performed in public at all times upon the streets and riverbanks” (Jackson, 1908, p. 43). Except for those homes owned by Americans, the water closets in all homes were of the pig-flushing variety. It was of no surprise then that there were many unnumbered pigs, many of them with decoration of human feces on their heads and faces. “The ubiquitous and iniquitous pig,” Jackson continued in his report, “feeds upon human excrement and in the end serves as food for people” (1908, p. 43). For Heiser, there was much to be done “to transform them from the weak and feeble race we have found them into the strong and enduring people that they may yet become” (1910, p. 177).

The scientific paper amplified the unsanitary habits of Filipinos as inherent, natural to the ‘race’. The colonized body had to be

surveyed and investigated such that in the end, a defecating Filipino was discursively constructed. “The fecal matter is deposited in the most convenient place – in the long grass, in pools and gutters or under the house” (Mclaughlin, 1909, p. 55). Both body and the environment needed reformation and control, a kind of cleaning up. As asserted by Heiser, “we are cleaning up these islands, left foul and unsanitary and diseased by generations of hygienically ignorant people” (1910, p. 177). The new techniques of laboratory analysis had given way to ceaseless cleaning, surveying and monitoring. “[S]anitary improvements are contemplated or underway in the large forms of the archipelago outside of Manila” (Washburn, 1908, p. 283). Indeed, as Heiser forcefully put it: “We are draining the land, as it were, before beginning the constructive health projects which are going to make these people the strong and healthy race we intend them to be (Heiser, 1910, p. 177).

The new colonial sanitary regime urged the Filipinos to do away with their unhygienic customs “for the factors in spreading infections can be nullified by the inculcation of cleanly habits” (Mclaughlin, 1909, p. 55). Both the laboratory and the scientific paper confirmed the dangers Filipino bodies posed to the colonial order of things. Parasitology and tropical hygiene pathologized Filipinos as carriers of infections and diseases: “dirty people of dirty habits many of whom are undoubtedly bacilli carriers” (Mclaughlin, 1909, p. 52). If their stools were infected, they were immediately sent to San Lazaro Hospital and detained there until the cholera *vibrio* finally disappeared from their stools. Fecal specimens were examined to control the customary, promiscuous defecation of Filipinos *at all costs*.

The work meant invasion of the accepted rights of the home and of the scale perhaps unprecedented for any community. The collection of the fecal specimens necessary might fairly be regarded as repulsive to modernity. Add to this the fact that the search was made among persons apparently healthy to themselves and others who could

scarcely fall even without the class of suspects and that those found positive were subjected to all inconveniences of isolation, separation from family, loss of earning capacity, etc. (Munson, 1915).

The obsession with excrement led to the establishment of some kind of orifical order where the orifices and its products were used to mark racial and social boundaries (Anderson, 1995). Uncontrolled defecations had the potential to threaten and endanger sublime American bodies. This idea reinforced the allegations that Filipinos, being in a “state of barbarous disorder,” were inherently delinquent and transgressive if left on their own accord. Laboratory medicine, in general, was closely linked with a growing concern with hygiene and personal conduct which rendered a non-white race, and, for that matter, the Filipinos were pathological and degenerate. Paul Freer believed that the people of the tropics by reason of their mode of life, their food, their backwardness in scientific procedures, and their superstitions were exposed to many infections.

The dangers posed by uncontrolled defecations to the colonial order of things can be further elucidated through what Julia Kristeva calls the “horror-potential of the body’s inside.” According to her,

The body’s inside shows up in order to compensate for the collapse of the border between inside and outside. It is as if the skin, a fragile container no longer guaranteed the integrity of one’s own and clean self... Urine, blood, sperm, excrement then show up in order to reassure a subject that is lacking ‘its own and clean self’ (1982, p. 53).

Mary Douglas takes a closer look at defilement in its socio-symbolic level as a means of dividing the line between society and nature, and within the social aggregate itself. For Douglas, filth is not a quality in itself but it applies only to what relates to a boundary. Douglas says,

Matter issuing from them (the orifices of the body) is marginal stuff of the most obvious kind. Spittle, blood, milk, urine, feces or tears by simply issuing forth have traversed the boundary of the body. The mistake is to treat bodily margins in isolation from all other margins (1976, p. 113).

The possibility of defilement is not inherent to what has been signified as filth; rather, it points us back to the other margins beyond the body's boundaries. "The potency of pollution is therefore not an inherent one, it is proportional to the potency of the prohibition that founds it" (Kristeva, 1982, p. 69). Citing George Battaile, Kristeva calls this "the marginalization of floating structures made possible by the logic of prohibition which constructs the object or the device of discrimination and differences (p. 69).

Lamarckianism

Rather than simply looking at climate as the main source of degeneration, the Americans subscribed to a Lamarckian doctrine that emphasized the inheritance of acquired traits. Lamarckianism was used to explain the origin of racial difference, which, in turn, helped to explain deviations from the normal sequence of development (Stocking, 1968). The central idea of the concept, which was widely accepted in the social sciences in America at the turn of the century, was spontaneous adaptation. Stocking asserted that the

changes in organic behaviour or structure which was caused either by direct environmental influences or were the product of the organism's responses to such influences were transmitted by heredity from parent to child (1968, p. 43).

Paul Freer echoed the same thought in his paper on the concept of immunity. He says,

From what has gone before we must conclude that the development of race immunity is a process of heredity, that the substances which confer certain types of immunity on the individuals of a given race have been produced by a course of development concomitant with the other manifestations of evolution and that the chemical bodies which confer the immunity in individuals must be vast in number (1907, p. 74).

The salience of Lamarckianism on race formation is that the presence of disease and one's susceptibility to it is based on one's adaptation to the environment. It points to the inheritance of acquired

traits that made Filipino bodies *acclimatized, adapted*, an akin to the environment they inhabit, unlike the sublime and transcendent American corporeality. Based on this discursive formation, Filipinos were considered *natural* carriers of diseases.

The classic investigation on a town outside Manila, “Medical Survey of the Town of Taytay,” required the expertise of a number of scientists of the Bureau of Science (Strong et al, 1908, p. 210). The most extensive medical survey that was undertaken in the colony at the time reported that the 6,094 inhabitants who participated in the survey got their water supply from 13 wells (Strong et.al, 1908, p. 210). The wells were of two classes: those dug on tuff formation; and those dug into the alluvium. Water from the first sources was unsafe due to very high concentrations of nitrogen in the form of albuminoid ammonia and nitrates. Water from the second sources indicated pollution with sewage or drainage from refuse animal matter. It had high numbers of microorganisms like *vibrios*, coliform, bacteria, *amoebae*, and *flagellate* (Strong et al, 1908, p. 216).

The scientific paper had succeeded in refashioning American bodies into subjectivities that had attained discipline over their lower body functions. The discipline was severely lacking in a grotesque, conquered race that needed to confess their putrescence to the sanitary demands of benevolent tutelage ritualized in the laboratory and textualized in the scientific paper. For how else to explain the ubiquitous presence of the gaping orifices of Filipino bodies vis-à-vis the absence of the colonialist’s corporeality. This kind of racism pervaded colonialist representation of the colonized (Dyer, 1980). Coupled with Spenserian and classical social Darwinism, Lamarckian thought informed the colonialists’ exegesis of corporeal experience, the colonial subject as a carrier of disease. Reading the scientific papers, one can not help but notice whether Americans did ever go to toilets. “Americans talk, write, report, police, supervise servants, hunt, fish and fight” (Anderson, 1995, p. 649). Filipinos, “men, women and children defecate and urinate in the streets, yards and public

space” (*Fourth Annual Report of the Philippine Commission*, 1903, Vol. 2, p. 23).

Lamarckianism also informed the teleological trajectory of the scientific, modernizing project of Benevolent Assimilation. It outwardly professed the aim of “winning the affection of Filipinos,” and at the same time it paradoxically stripped them of their culture and history at the moment of its enunciation. Thus, Woodrow Wilson and the rest of the colonialists who shared his opinion could not imagine a Filipino *people* and a Filipino *nation*. Jan Mohamed would consider this *manichaeon*, saying,

[J]ust as imperialists administer the resources of the conquered country, so colonialist discourse commodifies the native subject into a stereotyped object and uses him/her as a “resource”... by negating his/her individuality, his/her subjectivity,... s/he is now perceived as a generic being that can be exchanged for any other native (they all look alike, act alike and so on). Once reduced to his/her exchange-value in the colonialist signifying system, s/he is fed into the manichaeon allegory which functions as the currency, the medium of exchange, for the entire colonialist discursive system (1986, p. 83).

A gendered interpretation, one that takes up the inseparable nexus between gender and race, is articulated by Bonnie McElhinny. Filipino men, in this context, seen as uncivilized, savages, did not have the “manly character” needed for self-government. According to her, [A]s masculine practices organized around expertise and technical knowledge began to emerge so too did masculine practices organize around dominance. Gender and race were thus mutually constitutive in expansionist encounters. They also shaped though sometimes differently how the targets of imperial action were understood. Many believed that American manhood could best be made manifest through further territorial expansionism (2007, p. 213).

Implicit in the Lamarckian discourse is the belief that Filipinos had no other choice but to accept tutelage “in discipline of law and would learn to love order and *instinctively* yield to it” (Stocking, 1968, p. 253). In this sense, self-government could only be achieved if Filipinos would learn to reform their “promiscuous excretory habits”

by regulating the opening-and-closing of their anal sphincters. Benevolent Assimilation, therefore, required the colonized “to submit unstintingly to pedagogy of repression mastery” (Stocking, 1968, p. 253).

This sort of thinking on race formation conditioned most of the American officials, who more often than not spoke of the “white man’s burden” and of the need to lift up the backward races. Wilson’s pronouncements on the concept of self-government betrayed a strong Lamarckian tone. Like its Anglo-Saxon forebears, the strength of American character like the capacity for self-government was an effect of growth through time. According to Wilson,

[S]elf-government is a form of character. It follows upon the long discipline which gives a people self-possession, self-mastery, and the habit of order and peace... the steadiness of self-control and political mastery. And these things cannot be had without long discipline... No people can be given self-control of maturity. Only a long apprenticeship of obedience can secure them the precious possession (1921, pp. 52-53).

Conclusion

The scientific paper was a genre closely associated with the laboratory. It was produced in the form of volumes of laboratory reports, description of tropical environment and climate, discussions on hygiene, and physiological examinations like the numerous routine stool examinations undertaken by scientists at the Bureau of Science particularly at the height of epidemics. It textualized laboratory work and activity, radiating scientific truth, accuracy and authority, which colonial officials and scientists accorded respect.

The *Philippine Journal of Science*, was a source of knowledge that came into play toward the subjugation, control, and surveillance of a conquered people. The papers appeared as a series, connected, united, and animated by a single biomedical discourse that made possible a discursive formation that pathologized the colonial subjects. The Filipinos were an “abomination,” unhygienic, and deadly carriers of parasites and microbes that were endemic in the tropics.

The laboratory intruded into the everyday life of poor Filipinos, into the guts of the dregs of society, to make visible under the gaze of Benevolent Assimilation the sick body. The findings of the experiments, as textualized in the scientific paper, fostered the view that the pathogenic body was a threat to the colonial order of things. The scientific paper was anchored on the idea that certain races were vulnerable to the tropical environment and others were not. The notion of vulnerability was informed by a Lamarckian theory, where immunity and susceptibility to infections were based on racial character rather than simply on climate and the environment and later parasites and microbes.

The idioms of the scientific paper had the effect of rendering the participants in the surveys and experiments voiceless, thus excluding from the discourse defined by colonial inequalities. The eagerness to collect specimens of excreta was part of the whole project of building up knowledge about a *people, nation* that could be regulated and controlled. The scientific paper had discursively turned the colony into a laboratory “where an experiment with important bearings on the race problem is being conducted” (LeRoy, 1912, p. 90). Since the experiment had a bearing on the Filipino’s fitness for self-government, the Filipinos had to surrender their filthiness to disinfection and hygiene in order that they may gain entry into civilized living, and eventually achieve for themselves the ultimate goal of colonization – self-government.



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APPENDIX

Background of the Authors of the Scientific Papers

The authors of the scientific papers discussed in this paper were scientists, military officers, and medical doctors based in the Bureau of Science, the Army Board for the Study of Tropical Diseases, and the Bureau of Health. Those scientists and medical doctors based in the Bureau of Science and in the Bureau of Health also provided medical and laboratory instruction at the Philippine Medical School (1905), which later became the College of Medicine and Surgery of the University of the Philippines in 1908. The establishment of the Philippine Medical School antedated the founding of the University of the Philippines in Padre Faura St. where the U.P. Manila campus is located.

Paul C. Freer was a medical doctor who specialized in chemical research under the famous Adolf von Bayer in Munich where he got his PhD in Chemistry in 1887. He assumed the post of Director of the Bureau of Science in 1905, after a reorganization of the Bureau of Government Laboratories where he was its first Superintendent from 1901 to 1904.

William A. Washburn was a Medical Doctor and Chairman of the Philippine Civil Service Board.

Richard P. Strong was a medical doctor and First Lieutenant and Assistant Surgeon of the U.S. Army before he was appointed Director of the Biological Laboratory of the Bureau of Science. He did a number of original researches on tropical medicine, which brought him to most of the scientific institutions in the world like the London School of Tropical Medicine, Pasteur Institute of Paris, among others. He also specialized in immunity in the *Konigl Institut fur Infekstionkrankheiten* in Berlin. His laboratory research at the Bureau of Science, particularly his identification of the dysentery bacillus, earned him a Professorial Chair in Tropical Medicine at Harvard University. He also served as Chief of the Tropical Medicine Department and acting director of the Philippine Medical School. He was also the official physician of Governor-General W. Cameron Forbes.

Philip Garrison was a medical doctor and Assistant Surgeon of the U.S. Navy before he was detailed as Medical Zoologist at the Biological Laboratory of the Bureau of Science. He was also Associate Professor of Medical Zoology at the Philippine Medical School.

Ernest Linwood Walker was formerly with the laboratory of Comparative Pathology of the Harvard Medical School. He served as Acting Chief of the Biological Laboratory of the Bureau of Science for a time.

Fred Bowman did research in the Biological Laboratory of the Bureau of Science before he was detailed as Instructor of Tropical Medicine at the Philippine Medical School.

Eugene R. Whitmore was Captain of the Medical Corps of the U.S. Army and did research work in the Biological Laboratory of the Bureau of Science.

Weston P. Chamberlain was a Major of the Medical Corps of the U.S. Army and served as President of the Army Board for the Study of Tropical Diseases. He also did research work in the Biological Laboratory of the Bureau of Science.

Edward L. Munson was a medical doctor, Captain, and Assistant Surgeon of the U.S. Army and served as Assistant to the Commissioner of Public Health.

E.H. Ruediger was detailed at the Serum Section of the Biological Laboratory of the Bureau of Science. He was also Associate Professor of Bacteriology at the Philippine Medical School.

Edwin D. Kilbourne was Captain of the Medical Corps, U.S. Army, and Researcher for the Army Board for the Study of Tropical Diseases.

Horace D. Bloombergh was a Major in the Medical Corps of the U.S. Army and Researcher for the Army Board for the Study of Tropical Diseases.

David G. Willets worked as a helminthologist of the Biological Laboratory of the Bureau of Science before he was detailed in the Philippine General Hospital as Chief Pathologist. He was formerly assistant to Dr. Charles Wardell Stiles and pathologist in the Georgia State Sanatorium.

Thomas Jackson served as District Health Officer of the Bureau of Health.

Allan J. McLaughlin was Assistant Surgeon of the U.S. Public Health and Marine Hospital Service before he became Assistant Director of health. He was also Associate Professor of Hygiene at the Philippine Medical School.

Victor G. Heiser was Chief Quarantine Officer of the U.S. Public Health and Marine Hospital Service before he became Director of the Bureau of Health. He was also Professor of Hygiene and Chief of the Hygiene Department of the Philippine Medical School.

R.S. Rissler was Medical Inspector of the Bureau of Health.

Liborio Gomez was Laboratory Assistant in the Biological Laboratory of the Bureau of Science.

The members of the medical and laboratory expedition sent to Taytay, Rizal in 1909 likewise wrote the several sections of the scientific paper, "Medical Survey of the Town of Taytay". Aside from **Richard P. Strong** and **Philip Garrison**, these writers were the following: **George I. Addams** of the Division of Mines of the Bureau of Science; **Moses T. Clegg** of the Biological Laboratory of the Bureau of Science; **George F. Richmond** and **V.Q. Gana** of the Chemical Laboratory of the Bureau of Science; **Elmer D. Merrill**, Chief Entomologist of the Botanical Section of the Biological Laboratory of the Bureau of Science; **Paul Clements**, Medical Inspector of the Bureau of Health; **Ricardo Leynes** and **Rosendo Llamas**, medical students of the Philippine Medical School and student assistants to Dr. Philip Garrison; **Henry J. Nichols**, Lieutenant, Medical Corps of the U.S. Army and Researcher for the Army Board for the Study of Tropical Diseases; and **Leoncio Lopez**, **Vicente Manapat**, **Vicente Rivero**, **Luis Guerrero** and **Victor Sevilla**, medical students of the Philippine Medical School and student assistants to Dr. Fred Bowman.